

Individual paper summary:

1. The literature review explores the use of facial recognition as a biometric system in healthcare kiosks, highlighting its advantages over traditional methods like RFID cards and passwords due to its enhanced security and user-friendliness. The authors propose a deep learning-based login system that utilizes Convolutional Neural Networks (CNNs) to improve the accuracy and reliability of facial recognition. The study tests four CNN architectures—VGG16, ResNet50, Xception, and MobileNet—assessing their performance in real-time face detection, with VGG16 achieving 100% accuracy but lacking real-time efficiency, while ResNet50 showed high accuracy (99.531%) and effective real-time detection. Xception and MobileNet had lower accuracies of 80.018% and 92.934%, respectively. The findings suggest that implementing these deep learning techniques can significantly enhance user authentication in healthcare kiosks, improving both security and user experience, and contributing to advancements in biometric systems in the healthcare sector.
2. The literature on face recognition technology in healthcare kiosks emphasizes its advantages over traditional biometric systems like fingerprint and iris recognition, which can be limited by issues of loss or forgetfulness. The integration of deep learning, particularly through Convolutional Neural Networks (CNNs) such as VGG16, ResNet50, Xception, and MobileNet, has significantly improved image recognition capabilities. The study compares these architectures, revealing that VGG16 achieves 100% accuracy but struggles with real-time detection, while ResNet50 offers high accuracy (99.531%) and performs well in real-time applications. In contrast, Xception and MobileNet have lower accuracies (80.018% and 92.934%, respectively) and also face real-time detection challenges. The research underscores the need for effective user identification in real-time scenarios and calls for further exploration to enhance system robustness across varying lighting conditions and diverse user demographics.
3. The literature review discusses REMICARE, an Android application designed to improve medication adherence and enhance communication between patients and healthcare providers. Key features of REMICARE include an automated reminder system that alerts patients to take their medications on time, a user-friendly interface for easy navigation, and advanced image processing capabilities for efficient medication management. The app also provides secure cloud storage for

medical records, facilitating better interaction between patients and doctors, especially for remote consultations during the COVID-19 pandemic. Security is a priority, with the use of RSA encryption and gravitational search algorithms to protect user data, while medication expiry notifications further ensure patient safety.

4. The paper titled "Design of medical robot control system based on single-chip microcomputer" outlines a novel medical robot designed to enhance healthcare operations, particularly in managing COVID-19 prevention. The main goal is to assist healthcare services by improving efficiency and reducing manpower needs during the pandemic. The robot is built around the STC89C52 single-chip microcomputer, allowing for effective control of its functions. It features infrared sensors for obstacle detection and navigation, along with a tracking module for optimal pathfinding. Movement is controlled by two DC motors using an L298N drive template, ensuring precise maneuvering. An intelligent path planning mechanism employs a genetic algorithm to optimize inspections, while an OV2640 camera, powered by an STM32F4 microcontroller, enables data collection and facial mask recognition using the yolov5s algorithm. This functionality allows for real-time communication of patient information to healthcare providers, enhancing safety and operational efficiency in medical environments.
5. The literature review on medication reminder systems emphasizes the critical importance of medication adherence for effective treatment and recovery, as many patients forget to take their medications on time. It discusses existing technology-based solutions, such as the Wedjat smartphone application, aimed at reducing medication administration errors. The proposed system in the review utilizes an Android application that incorporates Optical Character Recognition (OCR) and Artificial Neural Networks (ANN) to improve the accuracy of medication reminders, particularly in interpreting handwritten prescriptions. The choice to develop the application for Android is strategic, given its significant market share, ensuring broader accessibility. The review also points to future enhancements that could make these systems more user-friendly, such as personalized medication information and flexible reminder options, ultimately aiming to promote better medication adherence among users.
6. The literature review on face recognition in medical applications highlights the significant evolution of face recognition technology and its growing relevance in healthcare. It explores various medical applications, such as patient identification,

monitoring, and improving the accuracy of medical records, which can streamline processes and enhance patient care. The review emphasizes the integration of deep learning technologies, which enhance face recognition capabilities in complex medical scenarios, leading to innovative solutions in medical engineering. One notable application discussed is the use of face recognition in rehabilitation robotics, allowing for improved patient interaction and personalized therapy sessions. The paper concludes by addressing the promising future prospects of face recognition in transforming medical practices, with ongoing research indicating its potential to significantly enhance healthcare delivery and patient outcomes.

7. The literature review on face recognition in robotics emphasizes its significance for effective human-robot interaction, particularly in ensuring safety and personalization. It focuses on video-based recognition methods suited for mobile robots, enabling continuous individual tracking for interaction. The authors investigate various still-image recognition techniques, highlighting the superiority of combining Principal Component Analysis (PCA) and Support Vector Machines (SVM), optimized with genetic algorithms, over traditional methods like eigenface and Fisherface. A key contribution is the integration of face recognition within a particle filtering framework, which enhances adaptability in dynamic environments by fusing different measurement sources. Evaluations in crowded indoor settings demonstrate the robustness of the proposed tracking system against real-world challenges. The authors suggest future research directions to improve algorithm efficiency, accuracy, and adaptability in robotic face recognition systems.

Summary of all the papers together:

The literature review examines the integration of advanced technologies in healthcare, focusing on facial recognition, medication adherence, and robotics. It highlights the advantages of facial recognition systems over traditional biometric methods, emphasizing a deep learning approach using Convolutional Neural Networks (CNNs) like VGG16 and ResNet50 for enhanced accuracy in real-time applications. The review also discusses the REMICARE Android application, which aids medication adherence through automated reminders and secure data management, particularly during the COVID-19 pandemic. Additionally, a medical robot designed to improve healthcare operations is introduced, utilizing a single-chip microcomputer for efficient control and real-time patient communication. Furthermore, the importance of technology-based medication reminder systems is addressed, advocating for the use of Optical Character Recognition (OCR) and Artificial Neural Networks (ANN) to enhance accuracy. Finally, the

review explores the evolving role of face recognition in robotics for improving human-robot interactions, stressing the need for adaptability and accuracy in dynamic environments. Overall, these advancements illustrate the potential for transforming healthcare delivery and patient outcomes.